

5.0 MPF STDT PROTOCOLS

The MPF STDT will consist of one test condition with three performance runs conducted at one set of operating conditions. The following subsections will discuss the waste to be burned, the test operating conditions, waste feed rates, total waste to be processed, and the operational sequence for each run.

5.1 WASTE CHARACTERIZATION

Spray tanks containing a 5% or less heel of Agent VX will be treated in the MPF during the MPF STDT. The State of Utah has defined Agent VX as acutely hazardous and identified it as a P999 waste. The same identification is applied to anything contaminated by Agent VX. The MPF does not treat any wastes containing PCBs that would be regulated under the Toxic Substance Control Act (TSCA), nor treat any waste materials with dioxin waste codes (F020, F021, F022, F023, F026, or F027).

Agent feed rates per charge and operating parameter limits for the MPF will be established by the MPF VX ATB. The STDT will be conducted within the operating envelope established by the MPF VX ATB.

The purpose of the STDT is to demonstrate that the lead emissions from processing spray tanks are not a threat to human health and the environment. A secondary purpose is to show the lead in the nose cone of the spray tank should be considered an embedded metal since minimal amounts of lead will partition to the exhaust gas or PAS Brine. Lead emission rates were estimated by calculations shown in detail in Appendix B. These calculations show that the lead emissions from the lead in the exterior paint and lead that migrates from the nose cone are not a threat to human health and the environment. The hole drilled in the nose cone prevents pressurization of the nose cone, while limiting the release of lead from the nose cone. Appendix B calculations also show that the lead remains in the nose cone of the spray tank. The lead should be considered to be embedded since so little migrates from the nose cone.

The STDT will demonstrate a total lead feed rate of 82.6 pounds per charge. Metal feed rates demonstrated by the processing of projectiles during the MPF VX ATB will remain the highest feed rates for other metals. Lead spiked during the Agent GB MPF ATB demonstrated the ability of the system to handle large amounts of lead. The PAS Brine removed the lead that partitioned to the exhaust gas in the MPF GB ATB.

5.2 TEST PROTOCOL AND OPERATING CONDITIONS

The MPF STDT will be conducted at one test condition. A total of 3 performance runs will be used to collect data on metal and PM emissions. The MPF STDT will demonstrate the lead in the nose cone behaves as an embedded metal and will not significantly migrate to the exhaust gases or PAS Brine. The MPF STDT will demonstrate that lead emissions from the processing of spray tanks are not a threat to human health and the environment. The one test condition will be performed under the following operating conditions which are within the limits established by the MPF VX ATB with the exception of the lead feed rate:

- Maximum Agent VX feed rate to the PCC of 26.4 lbs./hr (22 lbs./tank X 1.2 tanks/hr).
- A total lead feed rate of 99.1 lbs./hr (81 lbs. of lead/tank X 1.2 tanks/hr + 1.6 lbs. of lead/tank X 1.2 tanks/hr).
- Normal PCC range of temperatures of 1,425 °F to 1,650 °F. Temperature extremes are anticipated to be similar to those demonstrated during Phase 3 Spray Tank Systemization Testing in 1994 (1,239 °F to 1,707 °F).
- Normal AFB range of temperatures of 1,850 °F to 2,200 °F. Temperature extremes are anticipated to be similar to those demonstrated during Phase 3 Spray Tank Systemization Testing in 1994 (1,863 °F to 2,103 °F).
- Normal quench tower and venturi scrubber brine flows, venturi scrubber pressure drop, Brine pH, and density.
- Normal clean liquor flow rate, pH, and density.
- Monitoring of Agent VX in the MPF Duct using an ACAMS and a DAAMS.

The MPF STDT will be performed to demonstrate the lead emissions from processing spray tanks with a total lead charge weight of 82.6 pounds are not a threat to human health and the environment. The objectives of the MPF STDT are as follows:

- Determine concentrations of metals and PM in exhaust gases.
- Demonstrate the lead in the nose cones is embedded and only a limited amount of lead will partitioned to the exhaust gases or PAS Brine.
- Determine that particulate emissions during all tests are less than 34 mg/dscm corrected to 7% O₂.

5.3 COMBUSTION TEMPERATURE RANGES

The anticipated temperatures for the PCC and AFB will be within the operating envelope demonstrated during the MPF VX Trial Burn. These temperatures are consistent with the AWFCO tables shown in Appendix D. Experience with the MPF would indicate the temperatures vary within this temperature range. Initial heatup of the loaded tray followed by rapid combustion can cause excursions of – 150 °F and + 100 °F in the MPF PCC. If such temperature fluctuations occur in the PCC, the AFB will likely experience a smaller but corresponding temperature variation.

5.4 WASTE FEED RATES AND WASTE QUANTITIES TREATED

Trays bearing one spray tank containing less than 22 pounds of agent heel will be fed to the MPF no sooner than every 54 minutes. Each run is estimated to last three hours. The lead charged with each spray tank will include 81 pounds in the nose cone and 1.6 pounds in the paint on the exterior of the spray tank for a total of 82.6 pounds of lead per charge. The lead feed rate is summarized in Table 5-1. The anticipated Agent VX usage rates for the MPF STDT are summarized in Table 5-1. The Agent VX required is estimated at 110 pounds/run for a total of 330 pounds. Allowing a 25 percent safety factor, the consumption of test feed materials is expected to be about 412.5 pounds of Agent VX and 19 spray tanks.

Agent VX usage rates are approximate since the amount of agent present in the spray tanks will not be accurately quantitated nor will a DRE be calculated. This test will demonstrate the lead in the nose cones of spray tanks is embedded. Agent will be monitored in the exhaust gas for the test. The DAAMS tubes will be collected and analyzed for the test. Each set of DAAMS tubes collected during the run will be analyzed and included in the report.

TABLE 5-1. AGENT VX AND LEAD REQUIREMENTS FOR THE MPF STDT

Activity	Agent VX, lbs.	Embedded Lead, lbs.	Total Lead, lbs.	Number of Spray Tanks
Loading the MPF	22	81	82.6	1
Exhaust Gas Sampling, 3 hours	88	324	330.4	4
Total per Run	110	405	413	5
Total per STDT	330	1,215	1,239	15

5.5 OPERATIONAL SEQUENCE FOR EACH RUN

Three runs will be conducted based on the availability of spray tanks. The agent drained from the spray tanks to be used in the MPF STDT will be held in ACS tanks for each run until a sample of the agent can be obtained. When the agent for the run has filled an ACS tank, the tank contents will be sampled by the current method used to collect agent samples. It may be necessary to collect samples from two ACS tanks for each STDT run. Samples will be collected from the tank or from the Sampling Enclosure in Room 123.

The MPF will be loaded with two spray tanks to begin the run. Sampling will begin after the second spray tank has been placed in the MPF. Normal operating conditions will be maintained in the MPF. Spray tanks will be fed to the MPF no sooner than every 54 minutes until the sample collection process is complete. After the exhaust gas samples are collected, the DAAMS will continue to monitor the exhaust gas in the MPF Duct until the MPF PCC is empty. The Process Data Acquisition and Recording System (PDARS) will collect data from the parameters it normally monitors. Normal operations in the plant will resume at the completion of each day's testing. Once the STDT begins, spray tanks will only be processed during testing.

The MPF operator will record the charge time of every tray in accordance with TE-SOP-012 "MPF Furnace Startup, Operation and Shutdown". This information will be recorded on the MPF Waste Feed Log Data & Automatic Waste Feed Cut-Off Activation Report and submitted into the Daily Operation Report Package. This information will also be included in the final MPF STDT Report.